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(71) Applicant: **DAINIPPON PRINTING CO LTD**

(72) Inventor: **SUZUKI SHINICHIRO**

(54) **DIFFRACTION GRATING WHICH CAN BE IDENTIFIED FOR AUTHENTICITY AND RECORDING MEDIUM PROVIDED WITH THE SAME**

because the pattern for identification is difficult to be recognized in the front view.

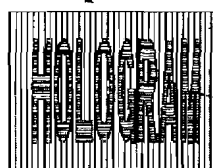
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(57) Abstract:

PROBLEM TO BE SOLVED: To provide a diffraction grating which can be distinguished by visual check whether it is authentic or forged without preparing a special means or to provide an article provided with the grating, while a conventional diffraction grating or a hologram subjected to processing for prevention of forgery requires a specifically prepared means to distinguish whether it is processed or not.

SOLUTION: The background pattern area 2 comprises a diffraction grating having a 600 to 5,000 nm grating pitch D, and an identification pattern area 3 for identification of authenticity comprises a grating having a  $\leq 500$  nm grating pitch d formed in the area 2. The both patterns are formed in such a manner that the back ground pattern area 2 can be seen in the front or near front view and that the identification pattern area 3 can be seen in a tilted position. It is more preferable to form the outer shape of the pattern with  $\approx 5$  ratio of the longer side line to the shorter side line

1 回折格子



2 背景パターン区域

3 真正性確認用  
パターン区域

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the diffraction grating in which the bona-fides check to which special processing which can prevent forgery was performed is possible.

This invention also relates to the recording medium with which such a diffraction grating was provided on the card or the article of other versatility.

[0002]

[Description of the Prior Art]Optical diffraction structures, such as a diffraction grating pattern and a hologram, are applied in the meaning which guarantees those bona fides in many cases to cards, such as a card for deposits and savings which a financial institution publishes, and a credit card which a card issuer publishes. Optical diffraction structure is too applied also to goods in which an imitation appears on the market easily, such as a wrist watch of a major brand, or the case of those in the meaning which guarantees those bona fides in many cases.

[0003]Being applied to the article of various fields besides the example of the above [ a diffraction grating or a hologram ] is carried out to since the hologram etc. have the difficulty of manufacture.

It is also because it has an interference color in appearance, and it is easy to pull eyes, excels also in design and it has a merit, like there are some which will be destroyed if it tries to remove further depending on the case.

[0004]However, since those manufacturing methods are manufactured using precise processing technology even if they are well known among specialists and are the cases where it is forged although the diffraction grating and the hologram have the difficulty of manufacture, It is dramatically difficult to obtain a genuine article and a very similar thing and to recognize in appearance, what was forged.

[0005]Then, conventionally, it is processed into a diffraction grating or a hologram and the trial which improves the safety to forgery is performed [ that it is various and ]. The thing of 0.3 mm or less of different color from the circumference forged difficult by constituting as partial sides, such as a figure and the shape of a character, preferably is indicated to be the predetermined rugged structure which exerts a diffracted-light study operation on the registered utility model No. 2582847. However, since the partial side indicated here cannot be seen unless it expands, a magnifying glass etc. need to be used for it although an authentic article or a counterfeit is recognized.

[0006]By laminating preferably the hologram accompanied by a reflexivity thin film layer with an adhesives layer via the brittle stratum disjunctum of pattern state to JP,9-73261,A, and making the fluorescence agent mix in one of layers further, Prevention of \*\*\*\*\* is possible, and if it irradiates with ultraviolet rays, light is emitted in fluorescence and the hologram brittleness seal in which distinction with what is not mixing a fluorescence agent is possible is indicated. However, in this art, although an authentic article or a counterfeit is recognized, it is necessary to use it, preparing an ultraviolet ray source.

[0007]Although the hologram of entering an information code for [ un-visible ] machinery reading is indicated for the patent No. 2842015 further again, It is necessary to use the reference beam at the time of recording the information code, although the information code for machinery reading is read and an authentic article or a counterfeit is recognized, and a conjugate reference beam (laser beam).

[0008]

[Problem(s) to be Solved by the Invention]Also in any of the conventional technology mentioned above, an

exterior, In order to use the usual diffraction grating or the usual hologram and to recognize the existence of processing added there, Let it be a technical problem to provide the article in which the diffraction grating which can recognize an authentic article or a counterfeit, or such a diffraction grating was provided by viewing, without preparing a means specially in this invention to having used the means prepared independently.

[0009]

[Means for Solving the Problem]By providing a pattern which consists of a diffraction grating whose lattice pitch is smaller than the surrounding diffraction grating in a part of diffraction grating in this invention, and considering it as a pattern zone for a bona-fides check, When observed from a different angle from the usual observation position, a bona-fides check was able to solve the above-mentioned technical problem as composition which becomes possible.

[0010]The 1st invention has a background pattern area and the pattern zone for a bona-fides check divided all over said background pattern area, and said background pattern area, Lattice pitch D comprises a diffraction grating which are 600 nm – 5000 nm, and said pattern zone for a bona-fides check is related [ that lattice pitch d comprises a diffraction grating which is 500 nm or less, and ] with a diffraction grating in which a bona-fides check by which it is characterized is possible. The 2nd invention relates to a diffraction grating in which a bona-fides check for which a pattern which constitutes said pattern zone for a bona-fides check is characterized by consisting of a character, a figure, signs, or those two or more combination is possible in the 1st invention. The 3rd invention relates to a diffraction grating in which a bona-fides check, wherein a ratio of the long side/shorter side of an outside of a pattern which constitutes said pattern zone for a bona-fides check is five or more is possible in the 2nd invention. the 4th invention -- a substrate top -- claim 1 -- a claim -- it is related with a recording medium with which a diffraction grating in which a bona-fides check, wherein a diffraction grating of a statement is laminated 3 either is possible was provided.

[0011]

[Embodiment of the Invention]As shown in drawing 1, the diffraction grating 1 in which the bona-fides check of this invention is possible has the pattern zone 3 for a bona-fides check, for example in the center section of the background pattern area 2 of a square outside. Although the outside of this background pattern area 2 can be decided arbitrarily and may comprise one kind of diffraction grating, without restricting to a quadrangle, it may comprise two or more kinds of diffraction gratings, and may have a diffraction grating in a part of background pattern area 2. The appearance of the diffraction grating 1 for a bona-fides check is mainly brought about by this background pattern area 2.

[0012]As for the background pattern area 2, it is preferred that lattice pitch D comprises a diffraction grating which are 600 nm – 5000 nm, and this is usually a lattice pitch of the diffraction grating used in this field. When the background pattern area 2 comprises two or more kinds of diffraction gratings, what is necessary is just a thing of the range whose lattice pitches of each diffraction grating are 600 nm – 5000 nm.

[0013]The pattern which constitutes the pattern zone 3 for a bona-fides check consists of a character string of "HOLO" which consists of four of the patterns of an English character in the example shown in drawing 1. This is an example to the last and, in addition to this, the patterns which constitute the pattern zone 3 for a bona-fides check may be signs, such as proper characters, such as a number, kana, or a Chinese character, a company emblem, a service mark, and a sign, or arbitrary figures. Or the patterns which constitute the pattern zone 3 for a bona-fides check may be two or more combination of these characters, a sign, or a figure. By considering it as such a pattern, the check of bona fides becomes easier. Although the pattern which constitutes the pattern zone 3 for a bona-fides check may always be constant, it can understand the classification of the article in which the diffraction grating 1 was formed by deciding some patterns beforehand, choosing from them and using.

[0014]As for each pattern which constitutes the pattern zone 3 for a bona-fides check, and by extension, the pattern zone 3 for a bona-fides check, it is desirable for lattice pitch d to be 500 nm or less.

[0015]In this invention, the reason set lattice pitch D of the diffraction grating of said background pattern area to 600 nm – 5000 nm, and lattice pitch d of the diffraction grating of the pattern zone for a bona-fides check was 500 nm or less is as follows.

[0016]As shown in drawing 3 (c), when the light which entered at the angle alpha to the normal of the diffraction grating 1 diffracts in the angle beta direction of the opposite hand of a normal, it has a relation of  $\sin \alpha + \sin \beta = m \lambda / \Delta$  (however, as for a degree and lambda, the wavelength of incident light and Delta of m are the pitches of a lattice.). Here, if the degree m is set to 1, it can ask for Delta by  $\Delta = \lambda / (\sin \alpha + \sin \beta)$ .

[0017]As shown in drawing 3 (a), in order to enter light and to enable observation of the diffraction grating 1 from the light source 4 of an  $\alpha = 30^\circ$ -degree direction to the normal of the diffraction grating 1 in a normal line direction, i.e., the observation position of  $\beta = 0^\circ$ . If wavelength shall be 500 nm (it is considered as the average value of visible light.), since it is set to  $\Delta = 500 / (0.5 + 0) = 1000$ , the pitch of a lattice will be set to 1000 nm. That is, in order to illuminate the diffraction grating 1 from the direction near a transverse plane and to make it watch from a transverse plane, the pitch of a lattice shall be 1000 nm as an example.

[0018]Next, as shown in drawing 3 (b), lean the diffraction grating 1 for a while, and light is entered from an  $\alpha = 15^\circ$ -degree direction to a normal. Since it will be set to  $\Delta = 500 / (0.2588 + 0.9659) \approx 408$  if wavelength shall be 500 nm (it is considered as the average value of visible light.) in order to enable observation of the diffraction grating 1 in the observation position of  $\beta = 75^\circ$  degrees of the opposite hand of a normal, the pitch of a lattice is set to 408 nm. Namely, more, turn the field of the diffraction grating 1 to the light source side, and as an observation position, The angle to the normal of the diffraction grating 1 is enlarged, and from the transverse plane of the diffraction grating 1, the pattern zone 3 for a bona-fides check sets the pitch of a lattice to 408 nm as an example, in order are not visible and to make it visible from the position of a big angle ( $\beta$ ) to a normal.

[0019]Therefore, by combining the two above-mentioned examples, and lattice pitch D of the diffraction grating of the background pattern area 2 being 1000 nm, and setting lattice pitch d of the diffraction grating of the pattern zone 3 for a bona-fides check to 408, From a transverse plane, when the background pattern area 2 can be seen, the diffraction grating 1 is leaned to the light source side a little, and it looks at the diffraction grating 1 from the direction near just beside, and the pattern zone 3 for a bona-fides check can be seen, it can be considered as the diffraction grating 1 in which a bona-fides check is possible.

[0020]Lattice pitch D of the diffraction grating of the background pattern area 2, Lattice pitch D becomes small as lattice pitch D becomes large and the light source 4 keeps away from the normal of the diffraction grating 1, when a value changes with the directions which install the light source 4 when it assumes that a diffraction grating is seen from a transverse plane and the light source 4 is in the position near the normal of the diffraction grating 1, but. In this invention, it is preferred to make lattice pitch D into the range of 600 nm – 5000 nm, and it is 600 nm to 1500 nm more preferably.

[0021]Lattice pitch D of the diffraction grating 1 of the background pattern area 2 in less than 600 nm. Since the light source 4 serves as a large angle to a normal, it is because the light source 4 becomes obstructive when looking at the pattern zone 3 for a bona-fides check, and is because there is disadvantage to which the tolerance level of the angle whose diffraction grating can be seen becomes narrow when lattice pitch D of the diffraction grating 1 of the background pattern area 2 exceeds 5000 nm.

[0022]As for lattice pitch d of the diffraction grating of the pattern zone 3 for a bona-fides check, it is preferred to be referred to as 500 nm or less. Since the light source 4 will need to enlarge a normal and the angle to make if lattice pitch d of the diffraction grating of the pattern zone 3 for a bona-fides check becomes very small to a degree, Since the light source 4 becomes obstructive like the case where lattice pitch D of the diffraction grating 1 of the background pattern area 2 is less than 600 nm when looking at the pattern zone 3 for a bona-fides check, it may be not less than about 200 nm preferably. If lattice pitch d of the diffraction grating of the pattern zone 3 for a bona-fides check exceeds 500 nm, the disadvantage to which the tolerance level of the angle whose diffraction grating can be seen becomes narrow like the time of lattice pitch D of the diffraction grating 1 of the background pattern area 2 exceeding 5000 nm will arise.

[0023]By the way, in the diffraction grating 1 in which the bona-fides check of this invention is possible, since it is hard to be visible at the front of the diffraction grating 1, it is not necessary to make the pattern zone 3 for a bona-fides check so small as a size of the pattern zone 3 for a bona-fides check that it not be visible by the eye. Of course, if the size of the pattern zone 3 for a bona-fides check shall be 0.3 mm or less, with the naked eye, it will be hard coming to be visible, but by expanding using a lens, a bona-fides check is attained and an advantage arises.

[0024]Each pattern which constitutes the pattern zone 3 for a bona-fides check is in addition good to constitute so that it may be shrunken and may be visible with the usual aspect ratio, while it is in every direction, when change, the proportion in every direction is changed so that it may be [ that it is longwise or ] oblong, it is constituted with the usual thing so that it may be hard to distinguish a pattern, and it is leaned. Drawing 2 is what was drawn about on about six, and makes the ratio length/beside each English character which constitutes the character string which consists of eight characters of "HOLOGRAM" 3 or so times compared with the ratio length/beside each English character in drawing 1 being about about 1.4.

[0025] Draw the border line of a character, by a diagram, since horizontal parallel lines were attached and shown in the border line, as for the English character of drawing 2 expanded perpendicularly, distinction looks easily, but. Actually the distinction with the background pattern area 2 and the pattern zone 3 for a bona-fides check which were constituted on the same material, Since it is only the diffraction efficiency of light, except when the diffraction efficiency of the light of both zones differs greatly, it is hard to carry out distinction, and when an aspect ratio differs from usual greatly, from a transverse plane, it is difficult for it to recognize it as it being a character, and its difficulty of distinction increases.

[0026] It is preferred that the ratio of the long side/shorter side of the outside of each pattern which constitutes the pattern zone 3 for a bona-fides check is five or more, and when it is less than five, the effect of a fall of the distinction nature of a pattern is scarce. In the viewpoint of the difficulty of distinction of a pattern, if the ratio of the long side/shorter side of the outside of a pattern is five or more, as large, it is better, but since a long side will exceed the size of a background pattern area if it enlarges too much actually, they are less than [ about tens ] (20 or less [ for example, ]) actually.

[0027] It is more preferred that the line which can cross and do the field and the diffraction grating 1 containing three of diffracted-light lines which reaches the incidence position on the incident light from the light source 4 and a diffraction grating and an observation position and the direction of the size of the direction which becomes long relatively among a and b are parallel. If the direction of the size of the direction where a pattern becomes long relatively, and the direction of the diffraction grating of the pattern zone 3 for a bona-fides check lie at right angles at this time, Since diffraction efficiency becomes high when observing the diffraction grating 1 from the angle (the observation position 5 shown in drawing 3 (b) corresponds.) greatly separated from the normal, the pattern zone 3 for a bona-fides check can be clearly seen.

[0028] In [ since the diffraction grating 1 of this invention has the above composition ] a desirable mode, Since the pattern zone 3 for a bona-fides check looks good when the background pattern area 2 can be clearly seen, and the pattern zone 3 for a bona-fides check cannot be clearly seen, if it watches from near a transverse plane, but it watches from the angle which changed the angle at which it looks and was separated from the normal of the diffraction grating, The bona fides of a diffraction grating can be easily checked by leaning a diffraction grating, without preparing and using a special means.

[0029] Although various uses can be presented with the diffraction grating 1 in which the bona-fides check of this invention is possible, as explained also to conventional technology, it can be applied to various kinds of cards, such as an ID card, brand-name goods, etc., and can enable the check of the bona fides of those articles.

[0030] Drawing 4 is what shows an example of the recording medium 11 which can be obtained as mentioned above, The diffraction grating 1 in which a bona-fides check is possible is formed in the right-hand side of the substrate 12 of the gestalt of a card, and it has the magnetic recording layer 13 a little to the down side in alignment with the top chord of the substrate 12, in addition the name of the name of a card, a number, the term of validity, and a holder, etc. are formed as the character 14. Here, the diffraction grating 1 and the substrate 12 are laminated by heat adhesion or adhesion through adhesives.

[0031] It is preferred that it is what it is rigid and cannot bend easily as a raw material which constitutes the substrate 12. Since the substrate 12 can be provided with other recording devices in addition to the above-mentioned diffraction grating 1, it is preferred that the processability at the time of providing the magnetic recording layer 13 and character 4 grade like the example of drawing 4, as a raw material of the substrate 12 is excellent.

[0032] As a raw material of the concrete substrate 12, polyvinyl chloride, polyester, Polycarbonate, polyamide, polyimide, cellulose diacetate, Independence, such as impregnated papers, such as metal, such as aluminum and copper, paper and resin, or latex besides resin, such as cellulose triacetate, a polystyrene system, an acrylic, polypropylene, and polyethylene, or a composite sheet can be used. When heat resistance is required, sheets, such as blended resin of amorphous polyester resin, amorphous polyester resin, and polycarbonate resin, can also be used as a raw material of the substrate 12.

[0033] Although the thickness of the substrate 12 changes also with construction material, the ranges of it are usually 10 micrometers – about 5 mm. In order for the substrate 12 to constitute the magnetic card based on an ISO standard, Thickness shall be 0.76 mm, and when forming a substrate by polyvinyl chloride (following, PVC), a 280-micrometer-thick white PVC sheet is usually used as a core sheet, A 100-micrometer-thick transparent PVC sheet is put on a two-sheet pile and its both sides as overcoating sheets, respectively, and this is used as a lamination layer sheet (total thickness of 0.76 mm) of 4 lamination laminated with heat pressing etc.

[0034] The magnetic recording layer 13 is usually a thing of the stripe shape about 5-10-mm width, What used

and applied (1) magnetic paint to the surface of the substrate 12, and was directly provided in it, (2) the thing which was applied to the thin plastic sheet, and was cut and stuck on stripe shape, or (3) -- it is formed by the transfer using the magnetic recording layer transfer sheet prepared for the temporary substrate sheet by laminating so that exfoliation is possible.

[0035] Usually it has the magnetic recording layer 13 in a common recording medium including a card. The function of the magnetic recording layer 13 may be replaced with an optical recording layer, an IC module, etc. However, even if the optical recording layer and the IC module are equipped, it is preferred to have the flexible magnetic recording layer 13.

[0036] The character 14 is for showing the name of an issuer or a card, an issuing number, the term of validity, a holder's name, notes, etc., if the substrate 12 is a card. An issuing number, the term of validity, and a holder's name may be formed with unevenness by embossing among these. In addition, coloring for ornamenting a card and grant of the pattern may be performed to the substrate 12, and coloring, grant of a pattern, and formation of the character by embossing are usually performed to it by printing.

[0037] As for the diffraction grating 1 applied on the substrate 12, it is preferred to be manufactured by carrying out extensive reproduction using the mold obtained by manufacturing a mold. . [ whether manufacture of a mold is performed by carrying out interference exposure of the laser beam to a photopolymer, and ] The electron beam lithography to the blank plate which applied resist to the metal substrate which can be etched, and etching accompanying it can perform, record an interference fringe as detailed unevenness, and the mold produced by usually doing in this way is made into a prototype, Some reproduction quality types are manufactured and this reproduction quality type is used in the case of an extensive duplicate.

[0038] Although embossing to a thermoplastic resin sheet can also perform extensive reproduction, It is fluid ionizing radiation hardening resin (usually) more preferably. Contact the mold face which applied ultraviolet curing nature resin on the bright film, and also has reproduction quality type detailed unevenness, and it was freely made to contact. By irradiating with ionizing radiation (if it is ultraviolet curing nature resin ultraviolet rays), and stiffening ionizing radiation hardening resin, it is preferred to carry out and the layered product by which the hardening resin film by which detailed unevenness of the diffraction grating was formed on the surface on the bright film by this method was laminated is obtained.

[0039] On the formed detailed unevenness, since the visibility of a diffraction grating is increased, usually along with detailed unevenness, laminating formation of the reflecting layer which usually consists of a metal thin film of reflexivity, such as aluminum, and a thin film of the raw material in which the rate of optical refraction differs from a hardening resin film is carried out.

[0040] A bright film, the hardening resin film in which detailed unevenness was formed, and the layered product which the reflecting layer laminated in order can form the diffraction grating 1 on the substrate 12 by laminating the bright film or reflecting layer side with the substrate 12 via adhesives, such as a thermal adhesives layer. Laminate between a bright film and the hardening resin films in which detailed unevenness was formed so that exfoliation is possible, and the reflecting layer side or via adhesives, such as a thermal adhesives layer, The diffraction grating 1 can be formed on the substrate 12 also by what is called transfer that laminates with the substrate 12 and exfoliates a bright film after lamination, simultaneous, or lamination.

[0041] The diffraction grating 1 in which the bona-fides check of this invention is possible can be used on them by using not the thing only for applying to the above card uses but various articles as a substrate, laminating it like the above. Although the case where it is a recording medium with which the article itself has information, and the article itself do not have information with an article, it may be the recording medium with which information was given by having laminated the diffraction grating 1 in which a bona-fides check is possible.

[0042] The recording medium 11 of this invention may be a card for ID (personal identification), and, specifically, may be deposits-and-savings cards, such as a bank, a credit card, an identification card, etc. An admission ticket to an examination, a passport, etc. which are not necessarily card type voice may be a recording medium for ID. The recording media 11 may also be prepaid cards for a means of transportation or public telephones, such as a bill, a gift certificate, a stock certificate, a security, a passbook, a ticket, and an airline ticket.

Information, including the amount of money, a publisher, an issuing number, notes, etc., is recorded on these.

[0043] Although the recording medium 11 of this invention does not necessarily have information, they may be various articles in which information was given by having laminated the diffraction grating 1 in which a bona-fides check is possible. Various articles are articles called what is called brand-name goods, such as a high-class wrist watch, the precious metals, and a jewel, such as globally prominent high-class goods, those housings, and a case, for example, and since these are expensive, they are usually the counterfeit targets easily. The diffraction

grating 1 in which a bona-fides check is possible may be similarly laminated on articles, such as storages with which a music title, image software, computer software, or game software was recorded, and those cases. Although these are not necessarily expensive, when extensive reproduction is carried out unjustly and it is marketed, there is a possibility that the selling agency of a regular article may suffer serious damage.

[0044]By laminating the diffraction grating 1 in which the bona-fides check of this invention is possible irrespective of the case where portions other than a diffraction grating have information, and the case where it does not have information, and unifying also in which recording medium, By checking the bona fides of the diffraction grating 1, it becomes possible to check the bona fides of the recording medium 11.

[0045]

[Effect of the Invention]Since the lattice pitch of the diffraction grating which constitutes each zone of a background pattern area and the pattern zone for a bona-fides check was specified according to the invention of claim 1, from near a transverse plane, The diffraction grating in which the bona-fides check which can distinguish the pattern zone for a bona-fides check with the naked eye is possible can be provided by the diffraction grating which constitutes a background pattern area looking good, and moreover, changing and seeing an angle, although the pattern zone for a bona-fides check does not look good. Since the pattern which constitutes the pattern zone for a bona-fides check consists [ according to the invention of claim 2 ] of a character, a figure, signs, or those two or more combination in addition to the effect of the invention of claim 1, When a diffraction grating is applied by the check of bona fides becoming easier and giving a meaning to a pattern, the diffraction grating in which the bona-fides check which the classification of the article which is a subject can understand is possible can be provided. Since the ratio of the long side/shorter side of the outside of a pattern besides a character which constitutes the pattern zone for a bona-fides check was made [ according to the invention of claim 3 ] or more into five in addition to the effect of the invention of claim 2, If recognizing it as it being a pattern besides a character changes and looks at an angle difficultly and conversely when it sees from near a transverse plane, the diffraction grating in which the bona-fides check which has an advantage which that it is a pattern besides a character tends to recognize is possible can be provided. according to the invention of claim 4 -- a substrate top -- claim 1 - claim 3 -- since the diffraction grating in which the bona-fides check of one of inventions is possible is laminated, it has an effect which one of the diffraction gratings of them demonstrates, and the recording medium which can check the bona fides of the subject itself can be provided.

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**CLAIMS**

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[Claim(s)]

[Claim 1]A diffraction grating in which a bona-fides check, wherein it has the following, said background pattern area comprises a diffraction grating whose lattice pitch  $D$  is 600 nm – 5000 nm and said pattern zone for a bona-fides check comprises a diffraction grating whose lattice pitch  $d$  is 500 nm or less is possible.

A background pattern area.

A pattern zone for a bona-fides check divided all over said background pattern area.

[Claim 2]A diffraction grating in which the bona-fides check according to claim 1 for which a pattern which constitutes said pattern zone for a bona-fides check is characterized by consisting of a character, a figure, signs, or those two or more combination is possible.

[Claim 3]A diffraction grating in which the bona-fides check according to claim 2, wherein a ratio of the long side/shorter side of an outside of a pattern which constitutes said pattern zone for a bona-fides check is five or more is possible.

[Claim 4]a substrate top -- claim 1 – a claim -- a recording medium with which a diffraction grating in which a bona-fides check, wherein a diffraction grating of a statement is laminated 3 either is possible was provided.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1]It is a figure of the diffraction grating of this invention.

[Drawing 2]It is a figure showing the state where the ratio of the pattern for a bona-fides check in every direction was changed.

[Drawing 3]It is a figure showing the relation between a light source and an observation position.

[Drawing 4]It is a figure showing the recording medium which applied the diffraction grating to the card.

[Description of Notations]

- 1 Diffraction grating
- 2 Background pattern area
- 3 The pattern zone for a bona-fides check
- 4 Light source
- 5 Observation position
- 11 Recording medium
- 12 Substrate
- 13 Magnetic recording layer
- 14 Character

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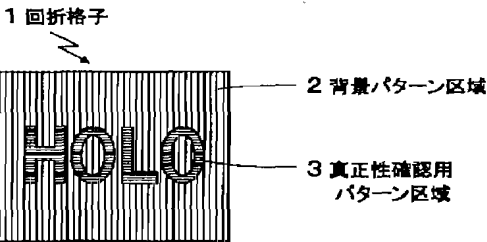
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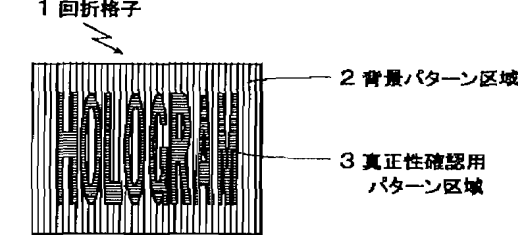
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- 3.In the drawings, any words are not translated.

DRAWINGS

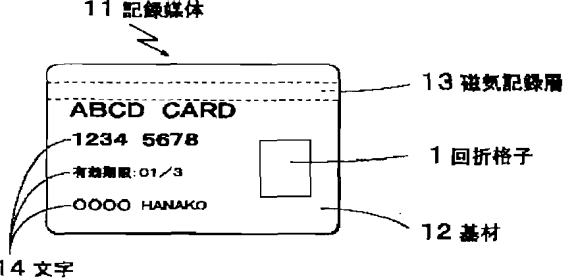
[Drawing 1]



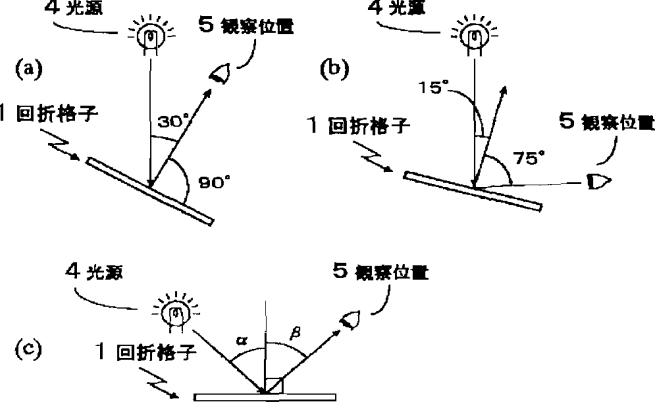
[Drawing 2]



[Drawing 4]



[Drawing 3]



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[Translation done.]